

Botanical Report – Fermilab 2002
Robert F. Betz
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New Species

During the 2002 growing season two native plant species were found at Fermilab.

- ◆ Flat-topped Aster (*Aster umbellatus*) was found in ELM-1 (Plot 1). It would appear that a seed mixture collected by an outside seed donor contained seeds of this plant. Since the species is usually found in low calcareous prairie marsh fens, it is surprising to find it in a developing mesic prairie community. It is quite possible that twenty-seven years of prairie restoration and its accompanying rebuilding of the former agricultural soil into a slightly alkaline prairie soil with its water-stable macro-aggregates and increase in soil micro-organisms has enabled this plant to survive in this tract.
- ◆ Cancer Root (*Conopholis americana*) was found in ELM-24 (Big Woods). This is an uncommon strange-looking root-parasite of trees, especially oaks. It forms large rounded knobs on tree roots. Since it lacks the green chlorophyll of most plants, its 3 to 4 inch flowering stems are chestnut-brown supporting small yellowish flowers. These thick sub-cylindrical chestnut-brown aerial flowering stems covered with scales resemble old pinecones lying on the ground.

Total Species

With these two additional species, there are now 261 native prairie and prairie marsh species along with 196 species of native trees, shrubs, and woodland flowers for a total of 457 native species found at Fermilab. Additionally, there are 168 non-native (exotic) herbaceous weeds and 30 species of non-native trees and shrubs for a total of 198 exotic species found at Fermilab for a grand total of 655 species.

Changes in Species Population

In spite of the moratorium on burning, most prairie and prairie marsh tracts continue to show increases in biodiversity.

- ◆ First Stage Prairie Species: A number of first stage species continue to increase their numbers in the older tracts of ELM-1 (Plots 1-11, 13) and ELM-26 (Plot 12), and the middle-age tracts of ELM-25 (Plots 14, 15, 16, 16B, 17). Examples of these species are: nodding wild onion (*Allium cernuum*), round-headed bush clover (*Lespedeza capitata*), wild quinine (*Parthenium integrifolium*), and golden Alexanders (*Zizia aurea*).

However, in many of these older tracts first stage species that were once very common are now decreasing and occur only as isolated specimens. Examples of these are: tall coreopsis (*Coreopsis tripteris*), showy tick trefoil (*Desmodium canadense*), yellow coneflower (*Ratibida pinnata*), black-eyed Susan (*Rudbeckia hirta*), rosin weed (*Silphium integrifolium*), and Indian grass (*Sorghastrum nutans*).

An interesting occurrence this year, which has not been observed before, was the profusion of prairie compass plant (*Silphium laciniatum*) and prairie dock (*Silphium terebinthinaceum*) in both the older and more recent tracts.

- ◆ Second Stage Prairie Species: Second stage species are now making their appearance and slowly increasing their populations throughout these older tracts. Some examples of these species are: Bicknell's sedge (*Carex bicknellii*), purple coneflower (*Echinacea pallida*), yellow gentian (*Gentiana flavida*), marsh betony (*Pedicularis lanceolata*), white prairie clover (*Petalostemum candidum*), purple prairie clover (*Petalostemum purpureum*), and Culver's root (*Veronicastrum virginicum*).

Relatively spectacular increases of these second stage species were observed this past season in ELM 1 (Plots 4, 7, 9). Examples were: thimbleweed (*Anemone cylindrica*), false dragonhead (*Physostegia virginiana*), prairie coreopsis (*Coreopsis palmata*), and common spiderwort (*Tradescantia ohiensis*).

- ◆ Third and Fourth Stage Prairie Species: Scattered isolated specimens of both third and fourth stage species are continuing to appear chiefly as isolated specimens in foci (advanced successional pockets) usually in the same areas populated by late first and early second stage species. Some examples of these third stage species are: lead plant (*Amorpha canescens*), sky-blue aster (*Aster azureus*), smooth aster (*Aster laevis*), and prairie dropseed (*Sporobolus heterolepis*). Examples of fourth stage species are the prairie gentian (*Gentiana puberulenta*) and yellow stargrass (*Hypoxis hirsuta*). The latter plant is not a grass but belongs to the Amaryllis family.

- ◆ Changes in the Marshes: Marshes continue to show increases in various species. Examples are the numerous non-descript sedges (*Carex spp.*), spike rushes (*Eleocharis spp.*), bulrushes (*Scirpus spp.*) and nut rushes (*Scleria spp.*). There has been a notable increase in gentians, such as bottle gentian (*Gentiana andrewsii*), yellow gentian (*G. flavida*), and stiff gentian (*G. quinquefolia occidentalis*), in the marshy-wet prairie ditch along the north side of Pine Street in ELM-14 and 18.

Table 1. New species for prairie and marsh tracts

Species	Common Name	Location
<i>Allium cernuum</i>	Nodding wild onion	ELM 4 (Plot 19)
<i>Amorpha canescens</i>	Lead plant	ELM 1 (9); ELM 25 (15)
<i>Anemone cylindrica</i>	Thimbleweed	ELM 1 (4)
<i>Angelica atropurpurea</i>	Great angelica	ELM 26 (12)
<i>Apocynum sibiricum</i>	Dogbane	ELM 25 (17)
<i>Asclepias incarnata</i>	Marsh milkweed	ELM 4 (19)
<i>Asclepias tuberosa</i>	Butterfly milkweed	BN RR
<i>Aster azureus</i>	Sky-blue aster	ELM 1 (1)
<i>Aster laevis</i>	Smooth blue aster	ELM 1 (7)

<i>Aster sagittifolius</i> <i>drummondii</i>	Drummond's aster	ELM 25 (7)
<i>Aster umbellatus</i>	Flat-topped aster	ELM 1 (1)
<i>Baptisia leucophea</i>	Cream wild indigo	ELM 25 (16B)
<i>Camassia scilloides</i>	Wild hyacinth	ELM 26 (12)
<i>Cicuta maculata</i>	Water hemlock	ELM 1 (1)
<i>Comandra richardsiana</i>	False toadflax	ELM 25 (14)
<i>Coreopsis palmata</i>	Prairie coreopsis	ELM 25 (14)
<i>Dodecatheon meadia</i>	Shooting star	ELM 1 (7,9); ELM 26 (12); ELM 25 (16B)
<i>Elymus canadensis</i>	Canada wild rye	ELM 1 (7); ELM 5 (21)
<i>Eupatorium</i> <i>maculatum</i>	Spotted Joe Pye weed	ELM 26 (12)
<i>Galium obtusum</i>	Wild madder	ELM 26 (12)
<i>Gentiana andrewsii</i>	Bottle gentian	ELM 25 (15)
<i>Gentiana flavida</i>	Yellow gentian	ELM 1 (1,9)
<i>Gentiana puberulenta</i>	Prairie gentian	ELM 1 (7)
<i>Gentiana quinquefolia</i> <i>occidentalis</i>	Stiff goldenrod	ELM 1 (13)
<i>Helenium autumnale</i>	Sneezeweed	ELM 1 (2)
<i>Hypoxis hirsuta</i>	Yellow stargrass	ELM 25 (14)
<i>Liatis aspera</i>	Rough blazing star	ELM 1 (6); ELM 26 (12)
<i>Liatis pycnostachya</i>	Prairie blazing star	ELM 1 (4,6)
<i>Liatis spicata</i>	Marsh blazing star	ELM 1 (10)
<i>Lobelia cardinalis</i>	Cardinal flower	ELM 1 (10)
<i>Lobelia spicata</i>	Pale spiked lobelia	ELM 25 (15)
<i>Lythrum alatum</i>	Winged loosestrife	ELM 1 (2)
<i>Pedicularis canadensis</i>	Lousewort	ELM 1 (7); ELM 26 (12)
<i>Pedicularis lanceolata</i>	Fen betony	ELM 1 (7); ELM 26 (12)
<i>Petalostemum</i> <i>purpureum</i>	Purple prairie clover	ELM 26 (12)
<i>Physostegia virginiana</i>	False dragonhead	ELM 25 (15)
<i>Potentilla simplex</i>	Common cinquefoil	ELM 4 (19)
<i>Pycnanthemum</i> <i>tenuifolium</i>	Slender mountain mint	ELM 1 (2); ELM 25 (17)
<i>Senecio pauperculus</i>	Balsam ragwort	ELM 1 (7); EJE RR
<i>Smilacina stellata</i>	Starry false Solomon's seal	ELM 1 (4); ELM 25 (17)
<i>Solidago</i> <i>gymnospermoides</i>	Viscid grass-leaved goldenrod	ELM 1 (2,7)
<i>Stachys palustris</i> <i>homotricha</i>	Woundwort	ELM 4 (19); ELM 25 (16)
<i>Veronia fasciculata</i>	Common ironweed	ELM 1 (3)
<i>Veronicastrum</i> <i>virginicum</i>	Culver's root	ELM 1 (3,10); ELM 4 (19); ELM 25 (14)

Viola sororia	Common blue violet	ELM 25 (16B)
Zizia aurea	Golden Alexanders	ELM 25 (16B,17); ELM 26 (12)

Twenty of 27 prairie tracts were checked at least once during the growing season for new species.

Table 2. Tracts with the highest numbers of new species for 2002 season.

ELM #	Plot #	# Times Visited	# New Species
26	12	2	10
1	7	4	8
4	17	1	5
4	19	1	5
1	2	1	4
24	16B	1	4

- ◆ Changes in the Woodlands: Woodland wildflowers are continuing to recover from heavy grazing caused by the overpopulation of deer. With the resumption of autumnal burns, woodlands are expected to progress toward climax flora of woodlands and/or savannas.

In this regard, it is interesting to note what occurred in the Big Woods. In the autumn of 2001, the woods experienced their first autumnal burn since the moratorium ended. In the following spring (2002), there was a carpet of woodland phlox (*Phlox divaricata*) throughout the woods. Scattered through this blue carpet of blooms were patches of both large-flowered trillium (*Trillium grandiflorum*) and declined trillium (*Trillium flexipes*). There were more of these patches and they appeared to be larger than seen in previous years.

- ◆ Weed Problems: A sad note is the slow but inexorable fall in the population of the native common cattail (*Typha latifolia*) and rise in the apparently introduced narrow-leaved cattail (*Typha angustifolia*) and the common reed (*Phragmites australis*). It is probable that the salting of the roads and highways have enabled both the narrow-leaved cattail and the common reed to survive this change in osmotic condition, whereas the common cattail cannot. It would appear that very little can be done to change this population decline.

The moratorium on burning has given a breather on the slow elimination of the crown vetch (*Cornilla varia*) patches in ELM-1 (Plots 4, 7, 9). Hopefully, with the return of burning, these patches will slowly disappear from the tract.

Seed Collection

- ◆ Collections at Fermilab: As in past years, group seed collecting was carried out on the last Saturday in September and the first Saturday in November. This year there was an increase in the number of participants. This is probably due partly to the relatively fine weather and partly to a relaxation in some security regulations.
- ◆ Collections at Local Prairie Remnants: As in past years, about a half-dozen collecting trips were made to a number of local prairie remnants to collect seeds of second and third stage species. Occasionally, a few seeds of a fourth stage species were collected and hand-planted in relatively small rich prairie patches where they were more likely to survive.
- ◆ Seed Exchange: As in past years, seed of later successional stages are also obtained from local forest preserve districts, such as DuPage, Kane, Kendall, and Will counties, in exchange for harvested seed of the first stage (matrix) collected at Fermilab.

Table 3. Seed collected or donated.

Habitat	Scientific Name	Common Name
Prairie and Marsh	<i>Allium canadense</i>	Wild onion
	<i>Allium cernuum</i>	Nodding wild onion
	<i>Amorpha canescens</i>	Lead plant
	<i>Andropogon scoparius</i>	Little bluestem
	<i>Anemone canadensis</i>	Meadow anemone
	<i>Anemone cylindrica</i>	Thimbleweed
	<i>Asclepia incarnata</i>	Marsh milkweed
	<i>Asclepias tuberosa</i>	Butterfly milkweed
	<i>Aster azureus</i>	Sky-blue aster
	<i>Aster ericoides</i>	Heath aster
	<i>Aster laevis</i>	Smooth blue aster
	<i>Baptisia leucantha</i>	White wild indigo
	<i>Bromus kalmii</i>	Prairie brome
	<i>Cacalia plantaginea</i>	Prairie Indian plantain
	<i>Calamagrostis canadensis</i>	Blue joint grass
	<i>Carex bicknellii</i>	Bicknell's sedge
	<i>Carex pellita</i>	Broad-leaved woolly sedge
	<i>Castilleja coccinea</i>	Indian paintbrush
	<i>Camandra richardsiana</i>	False toadflax
	<i>Coreopsis palmata</i>	Prairie coreopsis
	<i>Coreopsis tripteris</i>	Tall coreopsis
	<i>Desmodium canadense</i>	Showy tick-trefoil
	<i>Dodecatheon meadia</i>	Shooting star
	<i>Echinacea pallida</i>	Purple coneflower
	<i>Eryngium yuccifolium</i>	Rattlesnake master
	<i>Galium boreale</i>	Northern bedstraw

<i>Galium obtusum</i>	Wild madder
<i>Gentiana andrewsii</i>	Bottle gentian
<i>Gentiana flavida</i>	Yellow gentian
<i>Gentiana puberulenta</i>	Prairie gentian
<i>Helenium autumnale</i>	Sneezeweed
<i>Helianthus rigidus</i>	Prairie sunflower
<i>Heliopsis helianthoides</i>	False sunflower
<i>Heuchera richardsonii</i>	Prairie alum root
<i>Iris virginica shrevei</i>	Blue flag iris
<i>Liatris aspera</i>	Rough blazing star
<i>Liatris pycnostachya</i>	Prairie blazing star
<i>Liatris spicata</i>	Marsh blazing star
<i>Lilium philadelphicum</i>	Wood lily
<i>Lithospermum canescens</i>	Hoary puccoon
<i>Lobelia spicata</i>	Pale spiked lobelia
<i>Lysimachia quadriflora</i>	Prairie loosestrife
<i>Monarda fistulosa</i>	Wild bergamot
<i>Panicum leibergii</i>	Panic grass
<i>Parthenium integrifolium</i>	Wild quinine
<i>Pedicularis canadensis</i>	Prairie betony
<i>Penstemon calycosus/digitalis</i>	Smooth/foxglove beard tongue
<i>Petalostemum candidum</i>	White prairie clover
<i>Petalostemum purpureum</i>	Purple prairie clover
<i>Phlox glaberrima interior</i>	Marsh phlox
<i>Phlox pilosa</i>	Prairie phlox
<i>Physostegia virginiana</i>	False dragonhead
<i>Polygala senega</i>	Seneca snakeroot
<i>Potentilla arguta</i>	Prairie cinquefoil
<i>Prenanthes racemosa</i>	Glaucus white lettuce
<i>Pycnanthes virginianum</i>	Common mountain mint
<i>Ratibida pinnata</i>	Yellow coneflower
<i>Rudbeckia subtomentosa</i>	Sweet black-eyed Susan
<i>Scirpus atrovirens</i>	Dark green rush
<i>Scirpus validus</i>	Great bulrush
<i>Silphium laciniatum</i>	Compass plant
<i>Silphium terebinthinaceum</i>	Prairie dock
<i>Sisyrinchium albidum</i>	Common blue-eyed grass
<i>Sisyrinchium angustifolium</i>	Stout blue-eyed grass
<i>Solidago juncea</i>	Early goldenrod
<i>Solidago nemoralis</i>	Old-field goldenrod
<i>Solidago rigida</i>	Stiff goldenrod
<i>Spartina pectinata</i>	Prairie cord grass
<i>Sporobolus heterolepis</i>	Prairie dropseed
<i>Stipa spartea</i>	Porcupine grass

Savanna and Woodland	Thalictrum dasycarpum/revolutum	Purple/waxy meadow rue
	Tradescantia ohiensis	Common spiderwort
	Verbena hastata	Blue vervain
	Veronicastrum virginicum	Culver's root
	Zizia aptera	Heart-leaved meadow parsnip
	Zizia aurea	Golden Alexanders
	Carya laciniosa	Kingnut hickory
	Carya ovata	Shagbark hickory
	Hydrastis canadensis	Goldenseal
	Hystrix patula	Bottlebrush grass
	Lithospermum latifolium	Broad-leaved puccoon
	Phlox divaricata	Blue phlox
	Polemonium reptans	Jacob's ladder
	Quercus macrocarpa	Bur oak
	Quercus rubra	Red oak
Sanguinaria canadensis	Bloodroot	
Trillium grandiflorum	Large-flowered trillium	

Comments

With the restoration of burning, it is highly probably that the Fermilab prairie and wood communities will move forward in an ever increasing rate toward the climax vegetation that once covered this region in pre-settlement times.